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ACADEMIC STRESS, INTELLIGENCE AND ACADEMIC PERFORMANCE: AN EMERGING TOPIC ON MODERN EDUCATION

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ABSTRACT

Academic stress and intelligence is now a trending research topic in educational psychology. Behavioral science has specially focused into the topic and has suggested for conducting more extensive researches to find out the possible strategies. Numerous researches from worldwide have found relevant causes of effecting intelligence due to academic stress. Academic stress in response to academic achievement followed by intelligence has considered as butter within a sandwich to taste the successful events in life. There are numerous factors that affect academic performance due to interventions of stress as instance, stress due to exams, fear of failure, social burdens, financial burdens, student-teacher relationships, environment within the institutions and home, excessive course works, pressures on to be employed due to present unemployment scenario of the country or the states, lack of individual's self-concept and self-motivation, lack of peer supports or belongingness with teachers, pressurized to choose different subjects rather than individual choice, biological difficulties like physical disabilities, memory impairments or the instability of brain's function, health issues before or within the examination or within the course. Due to the fact causes and effects are investigated and have tried to relate each issue in a logical manner.

KEYWORDS: Academic Stress, Intelligence, Emotional Intelligence, Social Intelligence, Academic Performance.

1. INTRODUCTION:

Modern society gives importance to them who have best knowledge and intelligence as well as who have achieved success in their lives. Recently, curriculum has evolved into choice based courses, especially is developed after understanding the needs of an individual. After a long run Choice Based Credit System (CBCS) has been adopted to reduce the stress on behalf of individual's cognitive and intellectual capacities or choice [1]. The causes of Academic Stress has categorized into several ways by researchers. Some of them have placed the causes on social grounds [2], some gave importance on both home and school environments [3, 4], some found that Academic Stress causes due to over burden of syllabus [5], some emphasized on financial disparities [6, 7, 8, 9], demographic differences [7, 8, 9], gender differences [10, 11], demographic variables [9, 12] but, recently, it has studied on both intelligence and emotional intelligence. As a matter of fact, Academic Stress as well as Academic Performance somehow influenced by both IQ (Intelligence Quotient) and EQ (Emotional Intelligence Quotient) or vise versa. Goleman (1995) defines Emotional Intelligence as a combination of attributes closely related to personality [13]. However, Emotional Iintelligence differs from IQ and has maximum effects than IQ in relation to academic performance and other competences [14]. Even, Emotional Intelligence predicts, in most cases, the ability in people to adapt with their environments and is strongly collided with success in life, as it includes social, emotional and personal skills [15].

2. INVESTIGATION OF THE PROBLEM:

The study has focused on current issues on academic stress or Academic Stress this is emerged as a problem to score well in examinations. Side by side it deduces the self confidence and self-esteem of an individual that leads one to fall in stressful situation. Stress, even, interrupts one's intelligent capacities to handle any tough situation. Even studies found that stress has affected on the Hippocampus region of brains that reduce the tendency of remembering important information [16] as well as Amygdala region that controls Emotional Intelligence [17] hence, we may say it affects intellectual development of an individual that helps to cope with any difficult situation. So, based on previous studies, we have tried to investigate what causes Academic Stress and why intelligence as well as Academic Performance has affected due to the stress and finally we have focused on how Emotional Intelligence enhances the survival potentialities of students by considering stress on academic achievements.

3. OBJECTIVES:

As a fact of our investigation, objectives are developed in brief:

- To find out current issues of stress that affects Academic Performance or AP.
- To investigate why and how stress as a matter of fact hinders intelligence.
- Find out how Emotional Intelligence or EI helps to cope with the stressful situations.
- Finally, try to investigate how EI, IQ, AP and Academic Stress or AS are attached with each other.

4. STUDIES RELATED TO AP, AS, IQ AND EI.:

4.1. Studies on Academic Performance and Intelligence:

From last two decades, several researchers have shown more interest in the relationship between intelligence and academic achievement. Researchers mentioned that there are empirical evidence for a strong association between general cognitive ability and academic achievement, there is still anywhere from 51% to 75% of the variance in academic achievement that is unaccounted for by measures of general cognitive ability alone [18].

Watkins, Lei and Canivez [19] have stated there has been considerable debate regarding the causal precedence of intelligence and academic achievement. Some researchers predict intelligence and AP as identical constructs. However, others believe that the relationship between intelligence and achievement is reciprocal. Still others assert that intelligence is causally related to achievement have reported that students' achievement initially relies most strongly on their cognitive abilities through all grade levels [20].

As instance, a study conducted by Mudasir and Yatu in 2013, has found Kashmiri students are more intelligent than the Pakhtoon students; hence the establishing fact is that Kashmiri students showed better AP than Pakhtoon students [21]. Danista (2014) in her study entitled "Relationship between intelligence and academic achievement of secondary level students" has found that students having low intelligence have lower AP as compared to the AP of students from higher intelligence level [22].

A meta-analysis investigated by Roth (2015) including 240 literatures clearly shows that IQ has substantial influence on AP and thus can be regarded as one of the most influential variable. Results indicate that a broad measure of intelligence or 'g' (General Intelligence) respectively is the best predictor of AP. Study also has identified the importance of intelligence which increases throughout grade levels. Even intelligence has special importance in educational contexts which deal with content that is more complex and thus can be mastered fully only with an appropriate cognitive ability level [23]. Study hence, gave importance on both verbal and nonverbal intelligence tests to predict AP based on IQ.

Another study has suggested that efforts should be directed to develop analytical, practical and creative intelligence which all together will lead to the development of successful intelligence that will result in enhancing AP of adolescents [24].

4.2. Studies on Stress, IQ and AP:

Stress is occurred emotionally, mentally or physically as human often faces challenges [25, 26]. A study has confirmed that learning and memory abilities are affected by Stress [27] and stress is usually stimulated by and in confine related with a learning task [28]. A different study on stress conducted on learner's brain characteristics which were measured and their brain signals were then recorded using EEG at resting baseline state of Open Eyes

and Closed Eyes has concluded that Diverger is the Learning Style (LS) with highest IQ while Converger and Diverger are the LS that prone to Stress [29]. In another study researchers have found that lower IQ is derived from mental stress and poor environmental dilemma [30]. Studies over the years have demonstrated that student's poor performance and stress are positively related [31, 32].

4.3. Studies on effects of Stress on Cognitive functions of brain:

Biological effects of stress on the hippocampus that can influence subsequent cognitive functions **(Figure 1)**, such as learning and memory and represent an increase and decrease in hippocampal functioning, respectively [33].

Numerous studies on effects of stress on brain has studied by psychologist and medical scientist where they found hippocampal instability which causes due to stress hormone 'Cortisol' and effects both short term and long term memory. A list of researches based on Stress and Memory are shown later **(Figure 2)**.

Stress, therefore has effected on learning and memory as well as emotional intelligence. Memory is hindered during recalling the important information while need arises due to academic pressures or academic stress like the time of examination, writing important formulas, remembering important terms etc. Recollection of information initially derives from memory that somehow generates general intelligence or GI during learning process. No doubt, it has effected on long term basis i.e., on Academic Performance.

4.4. Studies on stressors or causes of Stress:

A study by Malik and Balda (2006) on adolescents having high IQ and AP who were tested for seven types of stressors viz. Existential Stress, Achievement Stress, Academic Stress, Social Stress, Institutional Stress, Financial Stress and Vocational Stress. Finding suggested that highly intelligent students who were under mental stress give poor performance in academic [35]. Among stressors, in study loads, social loads, and in health loads males have shown higher stress scores than females and that have significant impacts on their academic performance [5]. Financial stress [6, 7, 8, 9], and stress due to heavy course loads [36] also are found to be the causes of Academic stress.

The study related to find the most dominant stress for each stressor category was examined. The two most dominant stress categories are found including "TECATS" (Total Environmental/Campus/Administrative/transition Stressors) and "TACS" (Total Academic Stressors). The level of stress was found to be significant for all demographic variables evaluated [36]. Xiao (2013) indicates that AS is positively related to students' test anxiety including fear from of being failure in the exam is one of the strongest factors that cause stress in students [37] and negatively related to their academic test performance [8].

Health factors like high blood pressure, headache and sleep problems are mainly observed during exam days [38, 5] and researchers have claimed that these problems arise due to stress during exam days. Rani (2017) has stated that stress probably may trouble students in falling asleep or staying asleep because their bodies feel fatigue or their minds are struggled by stressful thoughts due to academic tensions [39]. Insomnia, depression, changes of sleeping pattern [9], lack of sound sleep [40] affect AP and are considered as the strong variables.

4.5. Studies on IQ, EQ and AP:

Pulido (2016) who conducted a study with huge sample including 1186 subjects, have resulted a relation of continuity with EI and AP when predicting EI scores on AP [41]. A study found that emotional intelligence and stress are negatively correlated with each other and high emotionally intelligent students experience less stress than low emotionally intelligent students [42]. Study offered by Rehana (2018) has shown that lower level of emotional intelligence lead towards higher level of academic stress by university students [43]. Anvita (2011) also revealed that EI, which represents healthy life of an individual, can reduce occupational stress [44].

Social intelligence as a part of Emotional Intelligence, studies related to AS has found social intelligence as a coping strategy that can favor academic life even high social intelligence level would have better degree of coping with the AS [45]. Another study reveals the relationship between the social intelligence and AP is low, as a matter of fact, students do not find healthy environment in schools for developing their social intelligence [46]. Eventually, in recent decades researchers have claimed that high social intelligence plays a vital role in reducing academic stress.

Social Intelligence in respect of gender differences places more investigation to do. Khan et al. (2015) has shown boys having much more stress in comparison to girls. The study concluded that school boys are more stressful than school girls [47]. A similar study based on medical students has revealed that male nurses have experienced more job stress than female nurses and there are differences in the area of job stress between male and female nurses [48].

A result of the study shows that the EI having a positive impact on the AP of the students [49]. Research has suggested students having high degree of EI have experienced with good academic outcomes and the students with the lower degree of EI have shown poorer chance of succeeding academically. Another study found that EI, test anxiety and AS are significant and predictive variables on the AP among university students [50]. The importance of extending EI education in the academic world therefore become necessary in order to educate students to be well prepared for stressful academic outcomes.

5. DISCUSSION:

After analyzing these mentioned literatures we have come to compile causes of AS. However, in maximum literatures support the fact that social and emotional intelligence as a remedy that can cut down the level of stress. Intelligence as a controversial topic in supporting academic performance has shown better improvements in grade levels. Even though, maximum studies support 'g' intelligence or GI on the matter of concern that 'g' intelligence enhances student's cognitive maturity to achieve good grads in exams. No doubt GI can be considered as the base of scoring well in academic or may say GI is the primary factor that can makeup stress by providing self-confidence in scoring well [51, 52, 53, 54].

Despite its importance, EI has merged into the center of psychological studies, both in clinical practice as well as in the academic world. Emotional intelligence is the ability to perceive and express emotions, applied to facilitate thinking, to understand and reason through them and to regulate them in oneself and in others [55] so that individual gets a chance to become socially intelligent.

Socially intelligent people are high in EI and hence they are enough potential to face stressful situations. Our, collected studies on social intelligence [45, 47, 48, 46] also have shown that social intelligence being a part of EI cannot be separated in the sense where social intelligence gives the strength to understand the environment, on the other hand EI helps to manage individuals strategies through mind and heart. These both parameters are important to manage the tough situation even may say to manage the stressful situation during academic life.

So, it may say that EI and SI (social intelligence) both would be the strong commander of reducing AS. These outcomes lead us to build a manageable relation with Academic Stress which may help to understand the Academic Performance. Our study was concern to find how IQ, EI, AS and AP are related in academic life. Therefore, a model has created on Academic Performance **(figure 3)**, which shows how factors like GI, EI and SI helps in AP and on the contrary, AS has considered as a strong intervening factor on Academic Performance.

6. CONCLUSION:

In conclusion study reveals that SI, EI, GI are the factors which can eliminate academic stress. However, it should be considered that stress cannot be separated from events of life. Stress, though, helps to score well in highly intelligent students, it's better to have some stress but long term tolerance would be harmful to any individual. Finally, it can be stated that AP is the combined result of GI, EI, SI and AS. Positively, school, colleges, universities must try to build suitable environments where student can freely access their intellectual potentialities so that they can satisfy their learning outcomes in the end of the year.

7. RECOMMENDATION:

Stress however cannot be separated from life events but if suitable environment and enough cooperation shall be provided then there may have chance of deducing level of stress as good as possible. Educational institutions are recommended to focus on this issue and will try to facilitate healthy environments as it is important to relate stress. Finally, as this study is theoretical rather than experimental, therefore, researchers of behavioral science should do more extensive researches on these topics.

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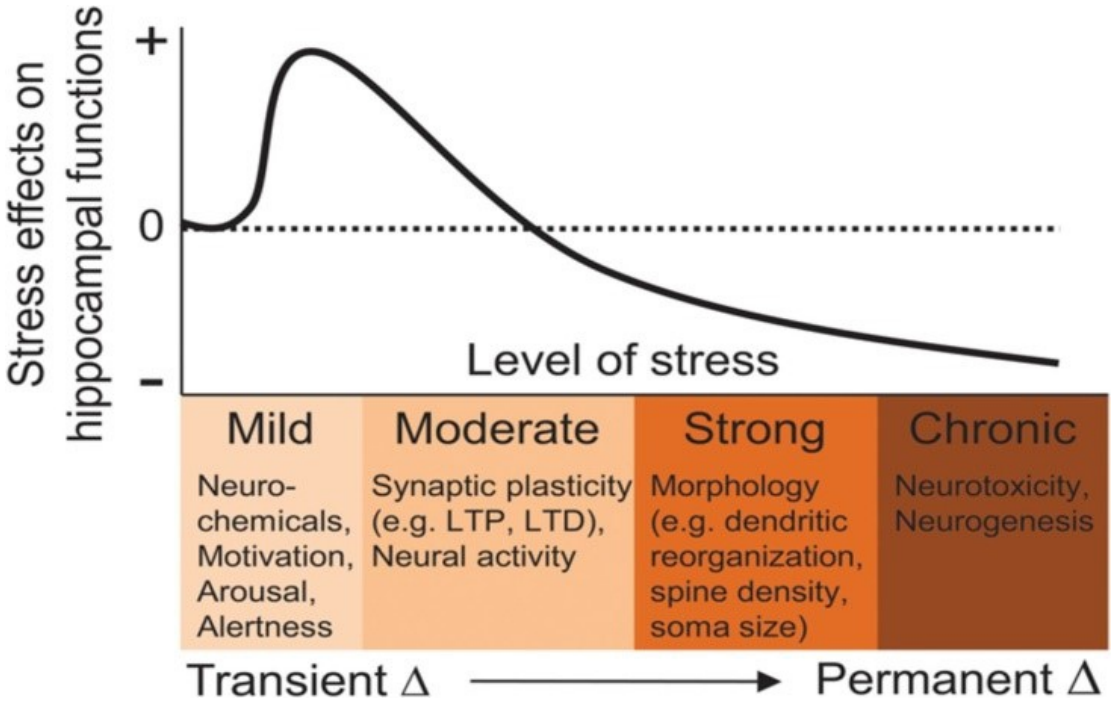

Adopted from: Kim and Yoon, 1998 [33]

Figure 1: Effects of stress on Hippocampus.

Study	Stress	Stress Timing	Stress Duration	Task	Effects	Caveats
Beckner et al. (2006)	Post-learning TSST Pre-retrieval TSST	30-min delay	10–15 min	Film	↑ LTM ---- LTM	
Buchanan and Tranel (2008)	Pre-retrieval TSST	10-min delay	20 min	Picture learning	↓ LTM	Impairment in cortisol responders
Buchanan et al. (2006)	Post-learning/pre-retrieval CPT	1-h post-learning, 10-min pre-retrieval	~3 min	Word learning	↓ LTM	Impairment in cortisol responders
Cahill et al. (2003)	Post-learning CPT	Immediately	~3 min	Picture learning	↑ LTM	
Campbell et al. (2008)*	Pre-retrieval cat exposure	Immediately or 60-min delay	~20–30 min	Water maze	↓ STM	
Conboy et al. (2009)*	Pre-retrieval/post-learning cat exposure	Immediately	30 min	Water maze	↓ STM	
Conrad et al. (2004)*	Pre-learning restraint stress	1-h delay	1 h	Y-maze	↓ STM	Only males impaired
de Quervain et al. (1998)*	Pre-retrieval foot shock	30-min delay	~1 min	Water maze	↓ LTM	
Diamond et al. (1996)*	Pre-retrieval/post-learning novelty stress	Immediately	4 h	Radial arm maze	↓ STM	Reference memory unaffected
Diamond et al. (1999)*	Pre-retrieval/post-learning cat exposure	Immediately	30 min	Water maze	↓ STM	Easy task unaffected
Diamond et al. (2006)*	Pre-learning and pre-retrieval cat exposure	Immediately	30 min	Water maze	↓ LTM	
Diamond et al. (2007)*	Pre-learning cat exposure	Immediately 30 min delay	2 min	Water maze	↑ LTM ---- LTM	
Elzinga et al. (2005)	Pre-learning cognitive stress	10–15-min delay	20 min	Word list, paragraph, spatial	↓ LTM	
Felmingham et al. (2012)	Post-learning CPT	Immediately	3 min	Picture learning	↑ LTM	Only for emotional info in females
Jelicic et al. (2004)	Pre-learning TSST	Immediately	20 min	Word learning	↓ STM ↑ STM	Impaired neutral, enhanced emotional
Kim et al. (2005)*	Pre-learning restraint + tailshock	Delayed	60 min	Water maze	↓ LTM	
Kim et al. (2001)*	Pre-learning restraint + tailshock	30–60 min delay	60 min	Water maze	↓ LTM	
Kuhlmann et al. (2005b)	Pre-retrieval TSST	10-min delay	~10 min	Word learning	↓ LTM	Only emotional words impaired
Li et al. (2013)	Post-learning/pre-retrieval TSST	1-h post-learning, immediately pre-retrieval	~15 min	Face learning	↓ STM	
Mccullough and Yonelinas (2013)	Post-learning CPT	20-min delay	3 min	Picture learning	↑ STM	
Nater et al. (2007)	Pre-learning TSST	Immediately	15–20 min	Word learning	↑ STM	Only enhanced cortisol responders
Park et al. (2006)*	Pre-retrieval/post-learning cat exposure	Immediately	30 min	Water maze	↓ LTM	
Park et al. (2008)*	Pre-learning and pre-retrieval cat exposure	Immediately	30 min	Water maze	↓ LTM	
Payne et al. (2007)	Pre-learning TSST	Immediately	20 min	Picture learning	↑ LTM ↓ LTM	Enhanced emotional, impaired neutral
Payne et al. (2006)	Pre-learning TSST	A few minutes delay	20 min	Picture learning	↓ LTM	Only impaired neutral
Payne et al. (2002)	Pre-learning TSST	Immediately	10–15 min	False memory production	↑ false memory	
Preuss and Wolf (2009)	Post-learning TSST	5-min delay	15 min	Word learning	↑ LTM	Only enhanced neutral
Quaedflieg et al. (2013)	Pre-learning MAST	Immediately 30-min delay	~10 min	Picture learning	↓ LTM	In immediate, cortisol positively associated w/recall; in delay, cortisol negatively associated w/recall
Sandi et al. (2005)*	Post-learning/pre-retrieval cat exposure	Immediately	30 min	Water maze	↑ LTM	
Schoofs and Wolf (2009)	Pre-retrieval TSST	10-min delay	15 min	Word learning	---- LTM	Only tested women in luteal phase
Schwabe and Wolf (2014)	Pre-retrieval CPT	Immediately 25-min delay 90-min delay	3 min	Word learning	---- LTM ↓ LTM ↓ LTM	
Schwabe et al. (2009)	Pre-retrieval CPT	30-min delay	3 min	Word learning	↑ LTM	Only enhanced emotional
Schwabe et al. (2008)	Pre-learning CPT	10-min delay	3 min	Word learning	↑ LTM	Only enhanced neutral
Smeets (2011)	Pre-retrieval CPT	15-min delay	3 min	Word learning	↓ LTM	
Smeets et al. (2008)	Pre-learning CPT Post-learning CPT Pre-retrieval CPT	5-min delay 5-min delay 8-min delay	3 min	Word learning	---- LTM ↑ LTM ↓ LTM	
Smeets et al. (2009)	Pre-learning TSST Pre-learning TSST Post-learning TSST	5 min delay 2 h delay 1 h delay	20 min	Stressor-related and stress-unrelated words	↑ LTM ↑ LTM ---- LTM	Only stress-related words affected
Woodson et al. (2003)*	Post-learning/pre-retrieval cat exposure	Immediately	30–45 min	Water maze	↓ STM	
Zoladz et al. (2014a)	Pre-retrieval CPT	Immediately	3 min	Word learning	↑ LTM ↓ LTM	Enhanced male cortisol responders; impaired male cortisol non-responders
Zoladz et al. (2014b)	Pre-learning CPT	Immediately	3 min	False memory production	↑ True memory ↓ False memory	Enhanced true memory in females only
Zoladz et al. (2014c)	Pre-learning CPT	Immediately	3 min	Word list learning	↑ LTM	Enhanced HR responders only
Zoladz et al. (2011a)	Pre-learning CPT	Immediately 30-min delay	3 min	Word list learning	↑ LTM ↓ LTM	Only emotional words affected
Zoladz et al. (2013)	Pre-learning CPT	30-min delay	3 min	Word list learning	↓ LTM	Only impaired in male cortisol responders
Zoladz et al. (2010)*	Post-learning/pre-retrieval IA training or IA retrieval	Immediately	30 min	Water maze	↓ STM	

CPT, cold pressor test; HR, heart rate; IA, inhibitory avoidance; LTM, long-term memory (≥24 h); MAST, Maastricht Acute Stress Test; STM, short-term memory (<24 h); TSST, Trier Social Stress Test. In some cases, the CPT was the socially evaluated version (SECPT); rat studies are marked with an asterisk (*).

Adopted from: Cadle and Zoladz, 2015 [34]

Figure 2: A list of studies examining acute stress effects on hippocampus dependent on learning and memory.

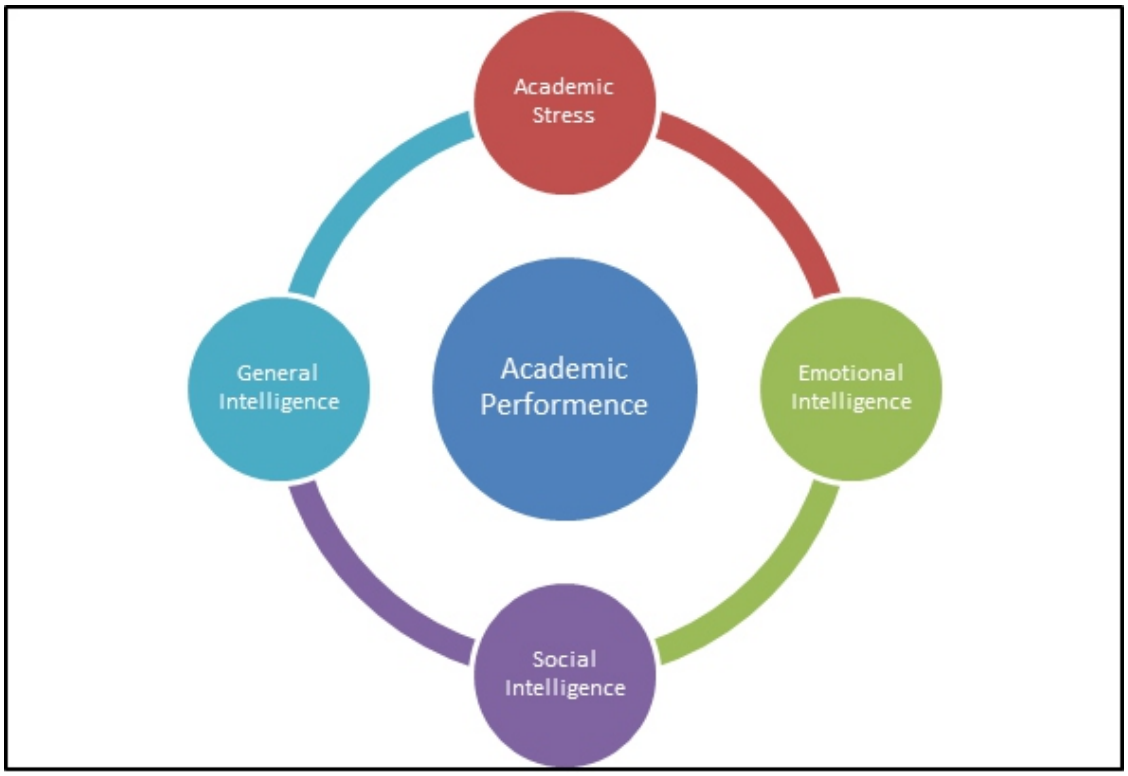

Figure 3: GI, EI, SI and AS together are the parts of AP.